

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Plant Abstract

Element Code: PDSCR0D3Q0

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE



ME: *Castilleja mogollonica*

COMMON NAME: Mogollon Paintbrush; White Mountains Paintbrush, Sulphur Indian Paintbrush, Yellow Paintbrush, Squawfeather.

SYNONYMS: *Castilleja sulphurea*, *Castilleja luteovirens*, *Castilleja rhexifolia* var. *sulphurea*

FAMILY: Scrophulariaceae

AUTHOR, PLACE OF PUBLICATION: F.W. Pennell, Notul. Nat. Acad. Sci. Phila., No. 237. 1951.

TYPE LOCALITY: United States. Arizona. Front of cabin; Phelps Botanical Area; Apache National Forest. Alt. 9500 ft. (=Phelps Cabin Research Natural Area, White Mountains, Apache County).

TYPE SPECIMEN: Isotype: NY 68128. W.S. Phillips 3442 with T.K. Phillips & T.H. Kearney, 11 August 1950.

TAXONOMIC UNIQUENESS: Genus *Castilleja* includes 200-250 species. "The uniqueness of *Castilleja mogollonica* as a species, however, was immediately recognized by Pennell (1951) and later confirmed by Holmgren (1973). It is geographically isolated from its closet extant relative, *C. sulphurea* of the Rocky Mountains and northern New Mexico, and is reproductively isolated from another close relative that grows in adjacent habitat, *C. miniata*. The evolutionary and biological significance of this particular species needs to be further addressed." (Bainbridge and Warren, 1992). *C. mogollonica* and *C. sulphurea* may have shared a common ancestor or *C. mogollonica* may be a direct descendent of *C. sulphurea*. Genetic studies could resolve this question. (Bainbridge and Warren, 1992).

DESCRIPTION: Stems erect, **tall (15.0-50.0 cm [6.0-20.0 in.])**, green or purple, angular, and pilose (hairy). Foliage green, pubescent; **leaf blades entire**, or rarely with 1-2 pairs narrow lateral lobes, lanceolate-attenuate, 3 veined. Inflorescence villose (long, weak hairs). **Bracts yellow, sometimes with yellowish-russet (rosy) tinge above**; are shorter and wider than leaves. Upper bract has 2 pairs of lobes, narrowed to obtuse or acute tips; lower bract is broadly rounded with single pair of lobes. **Calyx short**, 13.0-17.0 mm long with two sets of lobes. The top and bottom lobes are of equal length, the side lobes are shorter than the other pair but equal to one another. Corolla 15.0-17.0 mm long; galea is erect, straight, 9-10 mm long, bright green without, and pink within. Lip is thickish, deep green, about 1/5 as long as the galea, 3-ribbed, ribs extended into slender, acute teeth. Capsule 10.0-11.0 mm long; seeds 2.0 mm long.

AIDS TO IDENTIFICATION: Greenish-yellow or lemon-yellow flowers of *C. lineata* can be confused with *C. mogollonica*. Leaves of *C. lineata* always have three to five distinct linear lobes and the dorsal/ventral clefts of the corolla are slightly unequal. Leaves of *C. mogollonica* are rarely lobed and corolla clefts are equal. *C. miniata* (*C. confusa* in Kearney et al., 1960), may occasionally have yellow inflorescence, but these are longer (over 2.0 cm [0.08 in.]) than *C. mogollonica*. Kearney et al. (1960) do not include *C. mogollonica* in the key to *Castillejas*. A useful key is included in Holmgren (1973). Field identification generally possible from early July through early September (Bainbridge and Warren 1992).

ILLUSTRATIONS: Color drawing (Ripper 1984)
Color photo (Epple 1995)
Color photo (Rutman, in Falk & Jenkins et al. 2001)
Color photo (*In*
<http://www.swcoloradowildflowers.co/Pink%20Enlarged%20Photo%20Pages/castilleja.htm>)
Color photo (Nagel *in*
<http://www.colostate.edu/Depts/CoopExt/TRA/PLANTS/demogardens/grandmesa/images/cassulrn.jpg>)
Color photo of specimen (New York Botanical Garden *in*
http://scisun.nybg.org:8890/searchdb/owa/wwwcatalogrenz.detail_list?this_id=3569289)

TOTAL RANGE: White Mountains, Apache County, Arizona. The closest relative *C. sulphurea*, is found in Arizona, Colorado, Idaho, Montana, New Mexico, South Dakota, Utah, Washington and Wyoming (USDA Natural Resources Conservation Service, 2002).

RANGE WITHIN ARIZONA: White Mountains, Mount Baldy vicinity, Apache County.

SPECIES BIOLOGY AND POPULATION TRENDS

GROWTH FORM: Herbaceous perennial.

PHENOLOGY: Flowers late June - August; sets seed mid-July - September.

BIOLOGY: Begins aboveground growth in mid-summer. Short-tongued bees are likely major pollinators. Subterranean branching unlikely because this species not known to propagate vegetatively.

HABITAT: Moderately drained sites within wet grassy meadows and cienegas of high elevations associated with permanent or intermittent creeks (does not include the wettest portions of the meadows where *Minulus guttatus* and dense patches of *Carex* spp. are found).

ELEVATION: 8,500 - 9,500 ft. (2593 - 2898 m).

EXPOSURE: Gentle slopes of various exposures.

SUBSTRATE: Basalt derived with high organic content.

PLANT COMMUNITY: Subalpine meadow within mixed conifer forest. Associated species a diverse association of herbaceous perennials. The most common are *Achillea lanulosa*, *Deschampsia caespitosa*, *Helenium hoopesii*, *Iris missouriensis*, *Perideridia gairdneri*, *Phleum alpinum*, *Potentilla diversifolia* and *P. fruticosa*. It never occurs where *Deschampsia caespitosa* is the overwhelming dominant (which suggests that it is limited to certain phases of meadow succession), nor in portions of the meadow wet enough to sustain species such as *Mimulus guttatus*, *M. primuloides* or dense patches of *Carex* spp. Adjacent spruce-fir and mixed conifer forests are characterized by the following species: *Abies lasiocarpa*, *Picea engelmannii*, *P. pungens*, *Pseudotsuga menziesii*, *Pinus reflexa*, *P. ponderosa* and *Populus tremuloides*. (Bainbridge and Warren 1992).

POPULATION TRENDS: “Past impacts have extirpated at least 24 percent of its historic habitat and fragmented extant populations on the Apache-Sitgreaves National Forest” (Bainbridge and Warren 1992). Between 17,000 and 20,000 plants were estimated by Bainbridge and Warren (1992) to occur in ten of the twelve known populations of *C. mogollonica* occurring over 11.6 stream miles of occupied habitat. Roughly 50% of the known stream miles are low density, 25% are high density and 25% are moderate density (Bainbridge and Warren 1992).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS:	None (USDI, FWS 1996) [Category 2 USDI, FWS 1993] [Category 2 USDI, FWS 1990]
STATE STATUS:	Salvage Restricted (ARS, ANPL 1999) [Salvage Restricted (ARS, ANPL 1993)]
OTHER STATUS:	Forest Service Sensitive (USDA, FS Region 3 1999) [Forest Service Sensitive (USDA, FS Region 3 1993)]

MANAGEMENT FACTORS: Threats include limited distribution; degradation of wet meadow/riparian habitat due to livestock grazing; trampling by cattle; siltation of streams and streamside habitats due to grazing and timber harvesting; inundation due to dam construction and beavers; habitat fragmentation due to water development and habitat degradation. Although most *Castilleja* is unpalatable, *C. mogollonica* is smaller and has a brittle stem and thus is susceptible to both grazing and trampling.

CONSERVATION MEASURES TAKEN: Plants occur inside the Phelps Cabin Research Natural Area on the Apache-Sitgreaves National Forest. Comprehensive status survey conducted in 1991/1992.

SUGGESTED PROJECTS: A USFS management plan. Studies pertaining to genetics, pollination and the effect of habitat fragmentation. Monitor populations to determine natural and induced population fluctuations. Extend the boundaries of Phelps Cabin RNA to include areas of concentration of *C. mogollonica* between the current RNA boundary and highway 273. Surveys on the Fort Apache Reservation. Reassess general condition and extent of known populations every two to four years.

LAND MANAGEMENT/OWNERSHIP: BIA - Fort Apache Reservation; USFS - Apache-Sitgreaves National Forest.

SOURCES OF FURTHER INFORMATION

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ADDITIONAL INFORMATION:

Revised:	1989-11-08 (SST)
	1991-10-20 (BKP)
	1992-09-21 (BKP)
	2003-10-03 (AMS)
	2003-10-27 (SMS)

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Arizona Game and Fish Department. 20XX (= **year of last revision as indicated at end of abstract**). X...X (= **taxon of animal or plant**). Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. X pp.